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IDAHO

HIGH SCHOOL  
MANUAL.

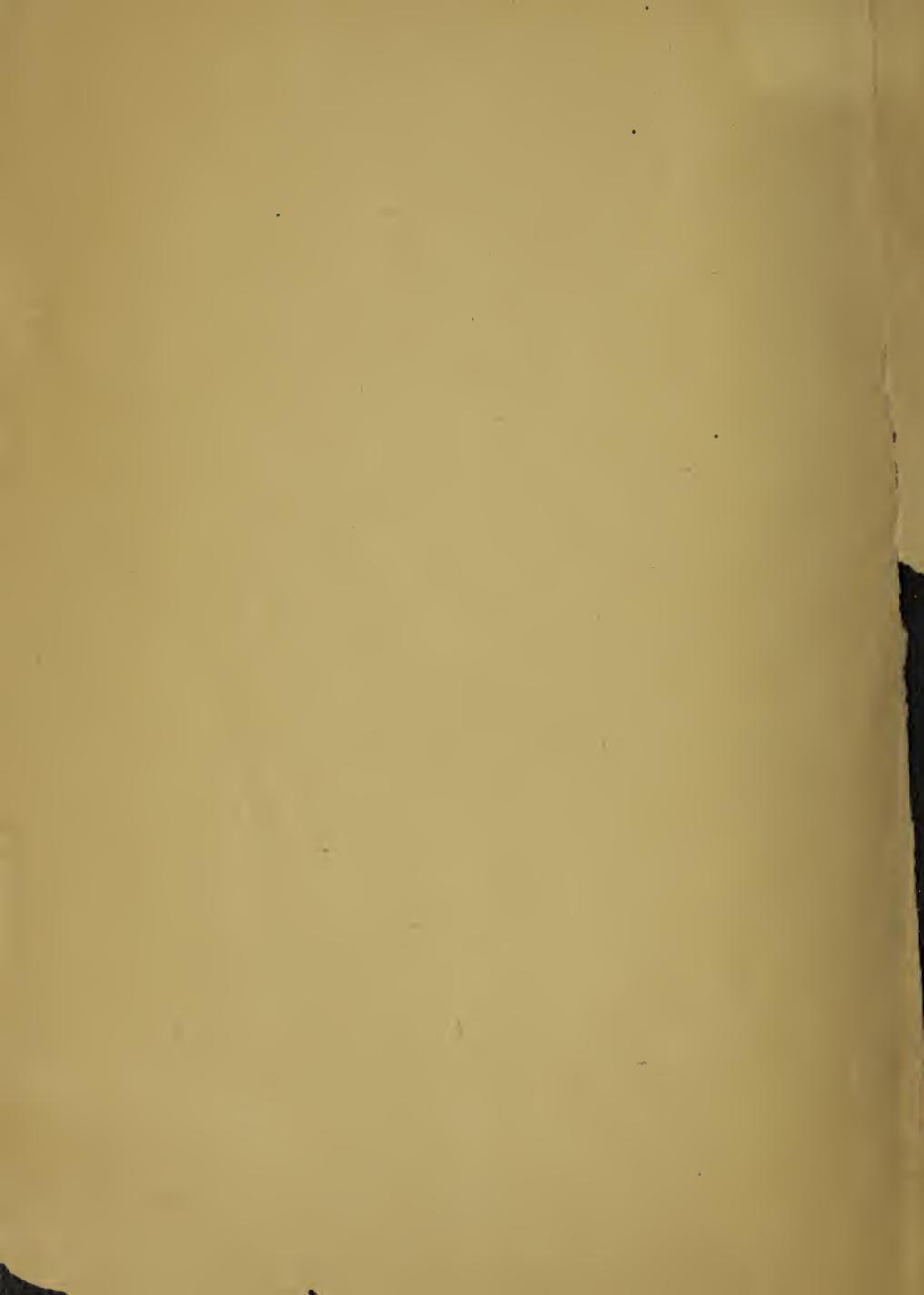
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THE UNIVERSITY OF IDAHO

1880.

THE STATE DEPARTMENT  
OF EDUCATION.

UNIVERSITY OF IDAHO  
1880-1881-1882-1883.



IDAHO  
HIGH SCHOOL  
MANUAL

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ISSUED JOINTLY BY  
THE UNIVERSITY OF IDAHO  
AND THE  
STATE DEPARTMENT OF EDUCATION

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POCATELLO  
THE ADVANCE PRINT  
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## INTRODUCTION.

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In presenting the outline and suggestions contained in this Course of Study the University and State Department of Education have been guided largely by the recommendations of the Committee of Ten, together with such suggestions and amendments as have been made by the N. E. A. in recent years. In the course of its preparation many other State courses of study were examined and much credit for very many valuable suggestions is due to a comparison of these courses.

The State Association, convened at Mountain Home in 1900, adopted resolutions to the effect that a system of accrediting the High Schools to the University is demanded. To accomplish the purpose of those resolutions has been one aim of this Course of Study. The amount of work necessary to prepare for any group of college studies is listed and the amount of credit to be given for the same.

We would urge that High Schools be provided with a reference library and respectfully recommend that in the purchase of same, great care be exercised in the selection of books, buying one year along one or two lines and the next along other lines until the library is well rounded. One or two reference books on a subject are not as satisfactory as a group of works in which intensive study can be made.

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## MODEL COURSES.

The courses here given are to be used as standard state courses, to furnish models for the arrangement of high school courses. The courses are sufficiently flexible to meet local conditions. Because it is not considered advisable for small high schools to carry more than one course of study, they should conform as closely as possible to the standard course.

## ONE YEAR COURSE.

For schools having three teachers.

## GRADE IX.

Mathematics .....	5	Mathematics.....	5
English .....	5	English.....	5
Book-keeping .....	5	Reviews .....	5
.....	5	Physiology.....	5
	<hr/>	20	<hr/>
			20

## TWO YEAR COURSE.

For schools having four to six teachers.

## GRADE IX.

Algebra.....	5	Algebra, .....	5
English .....	5	English .....	5
Book-keeping.....	5	Physiology .....	5
Latin .....	5	Latin .....	5
	<hr/>	20	<hr/>
			20

## GRADE X.

Algebra .....	5	Arithmetic.....	5
General History.....	5	General History .....	5
Cæsar.....	5	Cæsar.....	5
Botany..3 English..2 .....	5	Botany..3 English..2 .....	5
	<hr/>	20	<hr/>
			20

## THREE YEAR COURSE.

For schools having six to eleven teachers.

## GRADE IX.

Algebra.....	5	Algebra .....	5
English.....	5	English.....	5
Book-keeping.....	5	Physiology.....	5
Latin.....	5	Latin.....	5
	<hr/>	20	<hr/> 20

## GRADE X.

Algebra.....	5	Arithmetic .....	5
General History.....	5	General History.....	5
Botany..3 English..2 .....	5	Botany..3 English..2 .....	5
Caesar.....	5	Caesar.....	5
	<hr/>	20	<hr/> 20

## GRADE XI.

Cicero.....	5	Cicero.....	5
English.....	5	English.....	5
Physics.....	5	Physics.....	5
Geometry.....	5	Geometry.....	5
	<hr/>	20	<hr/> 20

## FOUR YEAR COURSE.

For schools having more than eleven teachers.

## GRADE IX.

Algebra.....	5	Algebra.....	5
Latin.....	5	Latin.....	5
English.....	5	English.....	5
.....	5	.....	5
	<hr/>	20	<hr/> 20

## GRADE X.

Algebra.....	5	Arithmetic.....	5
Caesar.....	5	Caesar.....	5
History.....	5	History.....	5
Botany..3 English..2 .....	5	Botany..2 English..3 .....	5
	<hr/>	20	<hr/> 20

## GRADE XI.

Plane Geometry .....	5	Plane Geometry .....	5
Cicero .....	5	Cicero .....	5
Physics..3 English..2.....5		Physics..2 English..3.....5	
.....5		.....5	

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## GRADE XII.

Vergil .....	5	Vergil .....	5
Chemistry..2 English..3....5		Chemistry..2 English..3....5	
.....5		.....5	
.....5		.....5	
.....5		.....5	

20

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1. Where the subject to be taught is not specified, the school may select any subject from the list in the University Entrance Requirements, or add any other important branch.

2. Where German or French is to be taught for students pursuing special courses it is recommended that the modern language study begin in the Eleventh Grade and continue through the Twelfth Grade.

## CLASSICAL COURSE.

Place Greek in Eleventh and Twelfth Grades. If modern languages are to be studied, place them in the last two years.

## SCIENTIFIC COURSE.

Substitute modern languages for all or a part of Latin in the model course. A two years' course in Latin followed by a two years' course in a modern language is recommended. Proper attention should be given to the science work by substituting the required sciences where the work is optional.

## PREPARATORY TO ENGINEERING.

Those preparing for Engineering groups in the University should have Trigonometry in the Twelfth Grade. The language work may be ancient or modern.

## BUSINESS COURSE.

That a course preparing for business life may have sufficient breadth of scholarship, it is recommended that the model course be followed with the placing of business studies

where studies are optional. A business course similar to the two year course for High Schools, substituting in place of Latin, Commercial Law in one year and Orthography and Business Composition in the other year, is the least amount of work for this sort of a course that the State Department will recognize.

#### ADDITIONAL COURSES.

The larger high schools arranging any additional courses are urged to follow the model course for the first two years. Special courses may be formed by making slight changes in the Eleventh and Twelfth years.

#### A SINGLE COURSE ADVISED.

Except in the larger cities it is a mistake to offer a variety of courses in the High School.

Additional courses increase the number of classes, diminish the size of the class and lessen the time the teachers can give to the class. Substitution should be allowed to those pupils only who are preparing for college and their work should be arranged in accordance with the above suggestions. In this way the body of the high school will follow one course, differentiating only where necessary. Adopt a single, carefully selected course and let the undivided energy of teachers and pupils be given to its pursuit.

#### UNITING CLASSES.

It is often of no consequence which of two subjects comes first in the course. Where the classes are many and small, arrange the course so that both grades can take care of one of the two subjects together the first year and have no class in the other. The next year let both of these grades take the other subject. For example, suppose Botany and Physics are to be taught in alternate years. In 1901 both grades, Tenth and Eleventh, take Physics, there being no class in Botany that year. The next year, the Tenth Grade having become the Eleventh, take Botany with the Tenth Grade. The union of classes may of course necessitate slight variations of the outlined course.

**COMMON BRANCHES FOR ADVANCED GRADES.**

In the last year of the course place should be provided for reviews in Arithmetic, Grammar, and such other common branches as may be necessary. This work should be a careful study of the fundamental principles of the subject. Pupils often leave school with an inadequate knowledge of the common branches. A review in the last year will enable the pupil to apply the principles he has learned in the other subjects to the thorough understanding of the common branches.

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**NOTES TO THE COURSE OF STUDY.****ALGEBRA.**

(See Mathematics.)

**BOTANY.**

One year should be given to Botany, beginning with the Fall Term and continuing to the end of the school year.

The laboratory must be well lighted, from a north sky if possible. It should be provided with firm tables, 27 or 28 inches high, and needful shelves and cases at the sides of the room. The microscopes should be of standard make, magnifying from 75 to about 600 diameters. The instruments made by Bausch and Lomb in the United States and those made by Leitz, Reichert or Zeiss in Germany are recommended. An instrument with coarse and fine adjustments, with 2-3 and 1-6 inch objectives and one or two oculars will prove very serviceable.

Each microscope should be provided with a set of dissecting instruments, containing a scalpel, forceps, scissors and pipette. Glass slips, cover glasses, alcohol and the re-agents

called for by the text should be freely supplied. There should be one-fifth as many microscopes as there are students in the class.

A suitable reference herbarium should be established containing species of native plants, and good specimens of the great types not found in the regions. These may be obtained by exchange with other schools.

A laboratory text is recommended and the student should be taught the structure, physiology and classification of plants and the methods of study of living plants. Enough technical terms should be taught to enable the pupil to be intelligent in his descriptions.

Require the student to make careful drawings in his note book at every stage of the work, and to accompany these by concise descriptions.

In addition to the laboratory work above noted the student should analyze and mount at least thirty-five specimens of native plants, representing the larger groupes of the vegetable kingdom, standard herbarium sheets  $11\frac{1}{2}$  by  $16\frac{1}{2}$  inches, being used for this work.

#### REFERENCE BOOKS.

- Arthur, Barnes and Coulter's Plant Dissection, (\$1.25)
- Bessey's Essentials of Botany, (\$1.25)
- Gray's Structural Botany, (\$2.00)
- Bennett and Murray's Handbook of Cryptogramic Botany (\$5.00)
- Coulter's Plant Relations, (\$1.10)
- Goodale's Physiological Botany, (\$2.00)
- MacDongal's Experimental Plant Physiology, (\$1.00)
- Britton's Manual of Botany, (\$2.00)
- Gray's Manual of Botany, Sixth Edition, (\$1.25)
- Underwood's Molds, Mildews and Mushrooms, (\$1.25)
- Coulter's Manual Rocky Mountain Botany.

#### CHEMISTRY.

Throughout the first half year, there should be three periods of recitation and three periods of laboratory work per

week; and throughout the second half year, two periods of recitation and three of laboratory work.

The laboratory work should be based upon a good text book and the work so conducted that the student will see and establish a proper connection between the theoretical part of the work and the facts upon which they are based.

The furnishing of a laboratory for work in chemistry for a class of from ten to fifteen students need not exceed twenty-five dollars. A table five by fifteen feet surface area and three and one-half feet high, a case for chemicals and reference books and a supply of water will give the necessary equipment.

The apparatus and chemicals to be bought will be determined by the text in use. The probable cost for a class of ten students to carry on the work required to enter the Freshman class of the University would be eighty dollars.

The pupil should be encouraged to consult reference books at all stages of his work. A few of the best are listed below:

#### REFERENCE BOOKS.

- Chemistry (briefer course) Remsen.
- Elementary Chemistry, Neweth,
- Experimental Chemistry, Newell,
- Laboratory Manual, Nicholson & Avery,
- Laboratory Manual, Keyson,
- Elements of Inorganic Chemistry, Shepard,
- Manual of Chemistry, Storer and Lindsay,
- Inorganic Chemistry (advanced course) Remsen,
- Organic Chemistry, Remsen,
- The Birth of Chemistry, Rodwell,
- Practical Chemistry, Harcourt & Madan,
- History of Chemistry, Venable,
- The Periodic Law, Newlands,
- John Dalton and the Rise of Modern Chemistry, Chemical Pub. Co.,
- The Discovery of Oxygen, parts I and II, Chemical Pub. Co.,

Experiments on Air, Chemical Pub. Co.,  
Liquification of Gases, Chemical Pub. Co.

### ENGLISH.

For the following outlines in English, acknowledgements are made to the "Report of the Committee on English for High Schools to the Association of Superintendents and Principals of Nebraska."

The pupils should be required to make written reviews of the books read at home. An outline of points to be covered should be given by the teacher. Reference books upon the teaching of these outlines are given at the close.

#### NINTH GRADE.

##### I.—TECHNICAL ENGLISH.

1. Grammar Study. A review of principles and inflections adapted to the needs of the class. Grammar for use rather than discipline is intended.
2. Capitalization.
3. Punctuation.
4. Abbreviation.
5. Forms of composition.
  - a. Heading.
  - b. Margin.
  - c. Indention of paragraphs.
  - d. Folding and indorsement.
6. Marks for correction of essays.
7. Review of ordinary letter forms.
8. Etymology as occasion arises.
9. Orthography and orthoepy incidentally.
10. Tense formation.

##### II.—CONSTRUCTIVE ENGLISH.

1. Extend the work as outlined in the preceding grades.
2. Description. A study of individual and class visualization.

**SUGGESTED EXERCISES.**—As an example of individual vizualization, ask the student to vizualize some friend or prominent character in town; as an example of class vizualization, he may describe briefly, by use of class characteristics, a policeman and a doctor. Many exercises of a similiar nature will suggest themselves to the teacher.

3. Individual and class characterization.
4. Visualization of places continued.
5. Visualization of interiors.

**SUGGESTED EXERCISES.**—In connection with this topic, the student may be asked to write several themes in which the visualization of the room will suggest the character of the occupant.

These exercises should not be given until the student has written effective descriptions of several rooms.

6. Mood study.

**SUGGESTED EXERCISES.**—Describe people who are angry, who are happy, who are sad, etc.

**SUGGESTIONS.**—As occasion arises, the work in technical English should be done in connection with the constructive work.

In all written work, consider natural and easy expression of chief importance.

It is also advised that every written exercise be carefully corrected by the teacher, and then returned to the pupil.

### III.—INTERPRETATIVE ENGLISH.

1. Continue the study of poetic and emotional words. Explain the various classes and have the student bring examples of each class. Then begin "Evangeline," emphasizing the study of words. (See Dr. Sherman's "Elements of Literature.")
2. Continue the study of "effects" of kind and degree.
3. Study of types.

4. Prose, poetic and emotional phrases. A study of the borrowed element in figures and figurative phrases.

SUGGESTIONS.—Have the student bring examples, such as “sighing treetops,” and ask him to explain the derivation and force of the borrowed element in each example. Apply this work to the selections studied during the year.

5. A more extended study of the elements.

SUGGESTIONS.—Selected poems from Tennyson, such as “The Lotus Eaters,” “The Passing of Arthur,” and “Sir Galahad” may be used very effectively in the study of figures, phrases and words.

6. The following points should be carefully studied in connection with all books assigned: (a) the author’s meaning; (b) the central thought or purpose; (c) is the interest of the book mainly in the characters or the incidents?

“Marmion,” “The Cricket on the Hearth,” “Sohrab and Rastum,” and “The Lady of the Lake” may be studied in the same manner as the work already outlined, but none of these selections furnish sufficient material for the study of characterization. “Captains Courageous” might be used for the study of effects in this grade.

7. Selections for reading at home.

Each student will select from this list and report as directed.

- a. Hawthorne: The Gray Champion, The Gentle Boy, Endicott and the Red Cross.
- b. Longfellow: Tales of a Wayside Inn.
- c. Poe: The Goldbug, The Purloined Letter.
- d. Dickens: A Christmas Carol.
- e. Scott: The Talisman, The Lady of the Lake.
- f. Cooper: The last of the Mohicans, The Spy.
- g. Hughes: Tom Brown’s School Days.

- h. Franklin: Autobiography.
- i. Hale: The Man Without a Country.
- j. Dickens: Nicholas Nickleby.
- k. Dodge: Hans Brinker.
- l. Stevenson: Treasure Island,
- m. Bayard Taylor: Lars.
- n. Warner: Being a Boy.
- o. Eggleston: The Hoosier Schoolmaster.
- p. Dana: Two Years Before the Mast.
- q. Porter: Scottish Chiefs.
- r. Dickens: The Old Curiosity Shop.
- s. Eggleston: American War Ballads.
- t. Irving: Life of Washington.
- u. de Amicis: Cuore.

#### TENTH GRADE.

##### I.—TECHNICAL ENGLISH.

In this grade attention should be given, as the needs of the pupils demand, to the points mentioned in the Ninth Grade. While instruction in technical matters should now be incidental, it should by no means be neglected. A list of common errors in English is here given for the use of both teacher and pupil in the revision of exercises.

- 1. Misplaced modifiers.
- 2. Lack of concord.
  - a. Subject and verb.
  - b. Adjective and noun.
  - c. Pronoun and antecedent.
  - d. Subject and complement.
  - e. Principal and subordinate verb.
- 3. Mistakes of case.
- 4. Mistakes of mood.
- 5. Misuse of shall and will.
- 6. Adjective or adverb.
- 7. Conjunctions and prepositions.
- 8. Reference of pronouns.

9. Unrelated participles.
10. Double negatives.
11. Wrong Verb forms.
12. Improprieties and barbarisms.

#### II.—CONSTRUCTIVE ENGLISH.

1. Conversation that characterizes.

**SUGGESTED EXERCISE.**—Ask the student to introduce two or more characters into his theme, and make the reader understand the character of each by means of the conversation.

2. Conversation that shows mood.
3. Visualization and characterization of a crowd.
4. Associational themes.

**SUGGESTED EXERCISES.**—Describe a place in such a manner that a stranger would wish to see it. Describe a place or a room in such a manner that the associational feelings are sad. Many exercises of a similar nature may be assigned.

5. Character through mood.
6. Write character sketches, selecting as subjects the various characters found in “Elaine.”
7. During this and the following year the fundamental principles of good composition should be systematically presented. The main stress should be laid upon numerous short themes and occasional longer ones. Paragraph themes in description of persons, places and objects within the experience or observation of the pupil may be continued. Point of view, selection and arrangement of details, vividness and accuracy should receive attention.

#### III.—INTERPRETATIVE ENGLISH.

“Tales of a Traveler,” “The Vision of Sir Launfal,” “Twice Told Tales,” and “Elaine,” and other Idylls constitute representative selections for study in this grade. These books or their equivalents may be used.

Study "Elaine," emphasizing the work on effects. Written preparation on the part of the student should be required.

Excellent results may be obtained by reading "Elaine" and several of the other Idylls, omitting as deemed advisable, the first selections mentioned.

Examples of the mode of association may be found in "The Tales of a Traveler." This book will furnish also some material for the study of the story. The mode of mystery may receive attention here.

The author's meaning, the central thought or purpose, and the selection and order of details, should be studied in connection with all books assigned for this grade.

Selections for reading at home.

Irving: The Alhambra, Selections from the Sketch book.

Whittier: Snowbound, Among the Hills.

Goldsmith: The Deserted Village.

Hawthorne: The old Manse, The Old Apple Dealer, House of Seven Gables, The Marble Faun.

Lowell: An Indian Summer Reverie, The Oak, Beaver Brook.

Bryant: The Forest Hymn and Others.

Poe: The Fall of the House of Usher, The Domain of Arnheim.

Blackmore: Lorna Doone.

Stevenson: Travels with a Donkey, An Inland Journey.

Smith: A White Umbrella in Mexico.

Allen: A Kentucky Cardinal.

Brown: Rab and his Friends.

"Ouida;" A Dog of Flanders.

Wordsworth: Michael, Hart-Leap Well.

Byron: Childe Harold.

Kipling: The Jungle Book.

Warner: *A-Hunting of the Deer.*

Wallace: *Ben Hur.*

**ELEVENTH GRADE.**

**I.—TECHNICAL ENGLISH.**

The direction for work in the tenth grade should here be followed. Attention should also be given to polite correspondence and to forms for official and other business.

**II—CONSTRUCTIVE ENGLISH.**

1. Subordination.

**SUGGESTED EXERCISES.**—Write themes introducing conversation between two people, and make prominent the mode of subordination. Many kinds of exercises under this topic may be assigned.

2. Interpretative writing.

**SUGGESTED EXERCISES.**—Write short themes in which such prose statements as “it is winter” are expressed in the feeling way.

3. Negative characterization.

**SUGGESTION.**—The student should introduce first character hints which give the reader a mistaken impression. Hints which establish the true character should then follow.

4. Write short original story.

5. In this grade an attempt should be made to enlarge upon and complete the study of fundamental principles begun in the preceding grades.

**SUGGESTIONS.**—Narrative descriptive themes, plot, character and mood. One element should be considered at a time and many short exercises be prepared and discussed. A theme of some length may be undertaken near the close of the year. These themes should be carefully criticised and revised in the light of all previous work.

The note books in the study of literature

should be regarded as part of the composition work, and time should be allowed for their careful preparation.

### III.—INTERPRETATIVE ENGLISH.

The following selections contain material suitable for the eleventh grade: Browning, Selected Poems; Maclaren, "Beside the Bonnie Brier Bush;" Chaplin, "Eli" and "The Village Convict." If time permits, one of Tennyson's Idylls or its equivalent may be read. It is suggested that the selections be studied in the order mentioned above.

The stories of "Eli" and "The Village Convict" will furnish excellent material for a study of visualization, character and mood. They may also form a basis for the study of story construction.

It is assumed that topics suggested before will be here kept in mind, and adapted to the particular selection of prose or verse in hand. The setting, the structure, the elements used, the plot, and the central thought will suggest topics in addition to those already mentioned.

Selections for home reading.

Goldsmith: The Vicar of Wakefield.

Dickens: David Copperfield, and Oliver Twist.

Thackeray: Vanity Fair.

Muloch: John Halifax.

Scott: Heart of Midlothian, Old Mortality.

Howells: The Rise of Silas Lapham.

Wilkins: A New England Nun.

Barlow: Irish Idylls.

Stevenson: Master of Ballantrae.

Barrie: A Window in Thrums.

### TWELFTH GRADE.

### I.—TECHNICAL ENGLISH.

1. Intensive work in Grammar. Six or eight weeks should be given to this.

**II.—CONSTRUCTIVE ENGLISH.**

1. Exposition. Occasional themes should be written outside of class. Personal consultation and class criticism should constitute important features not only of this particular topic but also of all the work in English.
2. Argument. Nature and purpose. Kinds. Order. Climax.
3. Actual practice in debate.
4. The constructive work of the eleventh grade should be continued.

**III.—INTERPRETATIVE ENGLISH.**

The minor poems of Milton, "Paradise Lost," I and II; "Silas Marner," and "Macbeth," or their equivalents are recommended as suitable books for the work in this grade.

The play of "Macbeth," should be studied with Dr. Sherman's analytic questions. A note-book should be used by the student and written work handed in at each recitation.

"Silas Marner" will furnish material for the study of the novel. If time permit, the minor poems of Milton, and "Paradise Lost" I and II, may be taken up for additional study.

The committee thinks it best that all of the interpretative work of the twelfth grade should be given consecutively in the first semester; and that the technical and constructive English should occupy the second semester.

**SUGGESTION.**—Those high schools that do not continue the work beyond the Eleventh Grade may omit some of the selections mentioned in the ninth, tenth and eleventh grades, and select for the last year's work Macbeth or other desired topics from the work as outlined for the twelfth grade.

Selections for home reading.

Emerson: Friendship, Self Reliance.

Wordsworth: Coleridge, Byron, Keats, Shelley.  
Burns: Selected poems.  
Arnold: On the study of Poetry, Culture, and Anarchy.  
Holmes: The Autocrat of the Breakfast Table.  
George Eliot: Romolo, and Adam Bede.  
Addison: Sir Roger deCoverley.  
Ruskin: Of Kings' Treasuries.  
Lamb: Essays of Elia.  
Tarbell: Abraham Lincoln.  
Hawthorne: Our Old Home.  
Shakespeare: The Tempest. A Midsummer Night's Dream, As You Like it, Twelfth Night.  
Olivant: Bob, Son of Battle.  
Thompson: Wild Animals That I Have Known.  
Scott: Ivanhoe.  
Kingsley: Westward Ho!

#### REFERENCE BOOKS.

Analytics of Literature, L. A. Sherman.  
Elements of Literature, L. A. Sherman.  
Analytic Questions on Shakespeare's Plays, L. A. Sherman.  
Books adopted in State Regular and Supplementary List.  
A First Sketch of English Literature, Henry Morley.  
English Literature, Taine.

#### FRENCH.

The first year's work should be thorough instruction in pronunciation and the rudiments of grammar with especial attention to these topics: "The conjugation of regular, and the more usual irregular verbs, such as dire, faire and the classes represented by dormir, connaitre, conduire, and craindre; the forms and positions of the personal pronouns; the use of other pronouns and pronominal adjectives; the inflection of nouns and adjectives for gender and number, excepting rare cases, and the partitive constructions.

The second year's work should include syntax and the reading of ordinary Nineteenth Century prose judiciously, varied with such short pieces of poetry as the teacher may select.

#### GERMAN.

The essentials of grammar should be regarded as the work of the first year with easy readings in the latter part of the year. The chief topics for drill are: the declension of articles, adjectives, pronouns and such nouns as are easily classified; the conjugation of the weak and of the more usual strong verbs; the commoner prepositions; the simpler uses of the model auxiliaries; and the elementary rules of syntax and word order.

In the second year the study of formal grammar need not occupy so much time, but it should not be neglected. The why's and the wherefore's of sentence structure should be brought out by grammatical study.

Students should be held to retain at least seventy-five per cent. of the words found in the texts read.

The committee of ten make furthermore the following requirements: "Ability to translate at sight a passage of easy prose containing no rare words. It is believed that the requisite facility can be acquired by reading not less than two hundred duodecimo pages of simple German. The ability to pronounce German and to recognize German words and easy sentences when they are uttered."

#### GEOLOGY.

Geology should be taught in an elementary way, training the student to notice the geological action of the wind, rain, frost, stream, tide, etc. The field is the best laboratory. A light pick and a geological hammer should be carried in making excursions.

Small bits chipped from the rocks and marked with the place, date, collector and name of the specimen when learned should go to form the student's collection. Notes should be written out respecting the work done.

The following books on Geology and Physical Geography should be accessible to the student:

Elements of Geology, LeConte.  
Manual, Dana.  
Elementary Geology, Tarr.  
Story of the Earth, Hilprin.  
Economic Geology, Tarr.  
Minerals and How to Study Them, Dana.  
Ice Age in North America, Wright.  
Ancient Life History of the Earth, Nicholson.  
Geological Story of Plants, Dawson.  
Extinct Monsters, Hutchinson.  
The Forms of Water, Tyndall.  
The Soil, King.  
Common Minerals and Rocks, Crosby.  
Physical Geography, Tarr.  
Physical Geography, Davis.

#### GEOMETRY.

(See Mathematics.)

#### GREEK.

Those pursuing the Classical Course will take two years of Greek. First Year: Elementary Lessons, Mastery of a Vocabulary, daily practice in reading aloud and in writing Greek and from fifteen to twenty-five pages of Xenophan's *Anabasis*. Special attention should be given to noun and verb forms and to the elementary principles of syntax.

Second Year. Xenophan's *Anabasis*, four books, or two books of the *Anabasis* and an amount of the *Hellenica* or of other Attic Greek, equivalent to two other books of the *Anabasis*. Greek prose composition based upon Books I and II of the *Anabasis*, or the completion of twenty-five to thirty lessons from some standard Greek Composition Manual.

#### GENERAL HISTORY.

The method advised is a combination of the Source and Topic Methods of teaching, placing in the hands of the pupil

a book of sources like Sheldon's and a short narrative text. The method of procedure:

1. Written answers to the questions in the source book.
2. Criticisms and comparison of answers. Proofs from the text.
3. Student places in note-book all new points.
4. Student makes outline in topical order. Compare and criticise.
5. Writing of narrative based upon the outline.

Each set of topics taken up should be treated as above outlined. Constant use should be made of historical maps and pictures. A number of historical maps in colors should be constructed during the year.

#### LATIN.

**FIRST YEAR:**—A mastery of the forms and simple rules of syntax as found in Elementary Text. Readings during later part of the year from *Viri Romae*.

**SECOND YEAR:**—Cæsar, four books, and Prose Composition based on the text, one period per week; or Cæsar two books and fifty pages of miscellaneous matter from *Nepos* and *Viri Romae*.

**THIRD YEAR:**—Cicero, four orations. Prose composition based on text, one period per week. The defense of Archias should be one of the orations, preferably taken last.

**FOURTH YEAR:**—Vergil's *Aeneid*, four books, one oration of Cicero. Drill in Prosody and Poetic Idioms. Ability to read metrically hexameters at sight.

The Roman pronunciation should be used. Train the student in accurate and ready pronunciation.

Schools that can do but one or two year's latin work should take the work as here outlined by years and not read a part of each year's work.

#### MECHANICAL DRAWING.

The work in Mechanical Drawing shall include orthographic projection, copy drawing, machine sketching, tracing and tinting.

### MATHEMATICS.

The various subjects of mathematics should be so taught that their relation to each other is apparent. The following arrangement is strongly advised. First year, Algebra to Simultaneous Quadratics; Second year, Algebra through Logarithms, one-half year; Higher Arithmetic, one-half year. Third year, Plane Geometry; Fourth year, Solid Geometry, one-half year; Trigonometry, one-half year.

Absolute accuracy must be insisted upon. The pupil must be able to explain the reasons for all steps taken in his work. There should also be a constant incentive to original thinking on the part of the student.

#### REFERENCE BOOKS.

- Mathematical Recreations, W. R. Ball.
- A History of Mathematics, W. R. Ball.
- Experimental Geometry, Paul Bert.
- Six-place Tables, Bremicker, Lemcke & Buechner.
- Observational Geometry, Campbell.
- Introduction to Algebra, Chrystal.
- The Common Sense of the Exact Sciences, Clifford.
- Arithmetic, Warren Colburn.
- Elementary Synthetic Geometry, Dubuis.
- Puzzles Old and New, Hoffman.
- Computation, Rules and Logarithms, Holman.
- Inventional Geometry, W. S. Spenser.
- Mathematical Essays, Schubert.
- Geometrical Drawing, A. J. Pressland.

### PHYSICS.

At least two hundred hours should be given to the subject. The method of teaching the subject should be a combination of laboratory work, text-book and thorough didactic instruction. Give at least one-half the time to laboratory work.

Careful note-book records should be kept at the time of the experiment. The pupil should write in good English the results of his own observations. He should not be permitted to copy the wording of the text.

The laboratory work should have the personal supervision of the teacher from the laboratory desk. Pupils should be required to make the experiments individually rather than in groups.

Water and sink (barrel tanks if necessary), gas, electric current and south exposure windows with curtains for darkening are essentials to be provided whenever possible. The expenditure of a few dollars upon a work bench and tools will enable much apparatus to be home made.

Spectrum charts and portraits of noted scientific men are better than bare walls.

Provide a well-filled case of reference books and good scientific journals for the reading table.

#### PHYSIOLOGY.

A considerable amount of laboratory work must accompany the work in Physiology. Dissections, if possible, made by the students themselves, must be included. All preparations must be studied and sketched by each member of the class.

The laboratory equipment will not need to be much in addition to that already furnished for the work in Botany and Zoology. Besides the study of fresh specimens each school should possess a series of typical mounted slides for illustration. This series should comprise the following list of slides: (1) frog's blood, (2) section of decalcified bone, (3) sections of developing bone and other tissue, (4) teased striated muscle, (5) cross-section of striated muscle, (6) cross and longitudinal sections of non-striated muscle, (7) cross section of a nerve, (8) section of skin, (9) section of a hair, (10) cross section of artery and vein, (11) cross section of trachea, (12) section of lung, (13) section of tongue, (14) section of salivary glands, (15) section of stomach wall, (16) cross section of small intestine, (17) section of tonsil, (18) section of lymph gland, (19) cross section of large intestine, (20) section of liver, (21) section of a pancreas (22) section of spleen, (23) section of kidney, (24) section of a ganglion, (25) section of cerebral cortex, (26) section of cerebellum,

(27) section of spinal cord, (28) section of eye, (29) section of tongue showing taste-buds, (30) section of thymus glands. Ground sections of bone, tissues with blood vessels injected, and special preparations of nerve endings are exceedingly reliable, but more expensive.

Good reference books on anatomy, physiology and hygiene should be supplied. Consult with your resident physician as to the best recent books.

#### ZOOLOGY.

The Zoology equipment is the same as for Botany. A small carefully selected collection illustrating the great groups of animal life of the region should be provided.

The regular laboratory work should cover the study of a limited number of carefully selected types, and this study should be accompanied by notes and drawings in all cases. The number of forms studied in one-half year should not exceed fifteen.

Excursions should be planned and field notes kept of observations of animal life. The following reference books are good. In addition provide books of travel descriptive of the fauna of other lands:

Aquatic Microscopy for Beginners, Alfred C. Stokes.

The Study of Animal Life, J. Arthur Thompson.

Life and Her Children, Arabella B. Buckley.

Winners in Life's Race, Arabella B. Buckley.

Birdcraft, Mabel Osgood Wright.

## UNIVERSITY ENTRANCE REQUIREMENTS FOR 1901 AND 1902

Applicants for admission to the Freshman class must be at least sixteen years of age, and must present satisfactory evidence of good moral character. They must submit to the President, or to the appropriate committee, credentials from their last instructor, or from the institution last attended.

Applicants from accredited schools, bringing the principal's certificate that they have completed the University requirements for a certain course, will be admitted to such course without examination.

Students coming from schools not accredited are advised to bring full, authenticated statements of work done, which will be considered on their merits, and will facilitate the classification of the student. Unless admitted on certificate, the candidate will be required to take examinations in all the work outlined below for the course he wishes to enter.

### ADVANCED STANDING.

Students who have completed work of college grade in other institutions of recognized standing may receive credit for the same on entering this University, by submitting full, authenticated statements of the ground covered and the time occupied. Other students seeking advanced standing will be required to take examinations.

### ADMISSION TO THE CLASSICAL COURSE.

#### MATHEMATICS.

**ALGEBRA.**—The whole of Wells' High School Algebra, or an equivalent text. This includes quadratics and logarithms.

**GEOMETRY.**—The equivalent of Wentworth's Plane and Solid Geometry.

#### ENGLISH.

**1. COMPOSITION.**—To test the student's familiarity with the fundamental principles of English Grammar and Compo-

sition, he will be required to write brief essays on themes assigned at the time and suggested by the following works:

1901 and 1902: Ivanhoe; Iliad, books I, VI, XXII and XXIV; The Sir Roger de Coverley Papers; Vicar of Wakefield; Ancient Mariner; Silas Marner; The Merchant of Venice.

1903: Merchant of Venice; Julius Caesar; The Sir Roger de Coverley Papers; Vicar of Wakefield; Ancient Mariner; Ivanhoe; Essay on Burns; The Princess; Vision of Sir Launfal; Silas Marner.

2. **LITERATURE.**—An examination will be given which presupposes a thorough study of the works named below:

1901-1903: Macbeth; Speech on Conciliation with America; Essay on Milton and Addison; Milton's Lycidas, Comus, L'Allegro and Il Penseroso; Gayley's Classic Myths.

No candidate will be accepted in English whose work is seriously defective in point of spelling, punctuation, grammar, idiom, or division into paragraphs.

#### LATIN.

1. **BEGINNER'S BOOK.**—Bain's First Latin Book may be taken as an index of the preparation required. If possible, selections from Viri Romæ or a text book of like difficulty should be read during the last third of the year and accompanied by exercises in prose composition based on the text.

2. Four books of Caesar.

3. Three orations of Cicero.

4. Prose composition based upon the text of Cæsar and Cicero read. The Roman pronunciation of Latin is required.

Teachers preparing students for the University are requested to devote special attention to prose composition throughout the course.

Beginning in 1902 four orations of Cicero and Sallust's Catiline will be required.

#### GREEK.

Beginners' Greek Book; forms and general principles of syntax; reading of easy Greek narrative: Xenophon's Anabasis, Book I.

### HISTORY.

A full year's work in General, Greek and Roman, or English History, will be accepted. It is recommended that at least three recitations a week for two years be given to History.

### ADMISSION TO THE SCIENTIFIC COURSE.

The requirements in Mathematics, English and History are the same as outlined for the Classical course. Two years of language other than English and two years of the Sciences outlined below are required. For 1901, Human Physiology and Physical Geography, a half year each, will be accepted in the Science requirement.

### FRENCH.

Two years' work should include:

- (a) Proficiency in elementary grammar.
- (b) Ability to translate simple French prose at sight. The requisite facility in translating can be obtained by reading concurrently with the grammar from eight hundred to one thousand pages of standard French.
- (c) Ability to translate easy English prose into French.
- (d) Ability to pronounce French and to recognize French words and simple phrases when spoken.

### GERMAN.

Two years' work should include:

- (a) Proficiency in elementary grammar.
- (b) Ability to translate simple German prose at sight. The requisite facility in translation can be obtained by reading concurrently with the grammar five or six hundred pages of German prose.
- (c) Ability to translate easy English prose into German.
- (d) Ability to pronounce German and to recognize German words and simple phrases when spoken.

### BOTANY.

TEXT.—Bergen's "Elements of Botany." The requirements represent a daily exercise of one hour five times a week for a year, or two hours three times a week, part laboratory,

for the same period. It is recommended that a note book with the experiments outlined in the text accompany applicant's standings. No work which has not been accompanied by some study with the compound microscope will be received. This work can be carried on all through the winter without the facilities of a green-house, provided the teacher has preserved many of the studies and tissues in alcohol. Seeds can be germinated and grown in a box of sawdust or sand placed in a moderately warm place and one in which the temperature is equable. A glass or galvanized iron tank in the same equable temperature, when partly filled with earth and water plants, will give an abundant supply of many fresh water algæ, during the colder season if the water is kept fresh by frequent renewals.

#### PHYSICS.

The requirements represent a daily exercise during one school year. The applicant will be required to show a knowledge of Physics as given in the better high-school text books.

#### CHEMISTRY.

Entrance requirements in Chemistry are the same as outlined under Courses 1 and 2, Department of Chemistry.

#### ZOOLOGY.

A half-year course should include not less than 54 two-hour laboratory periods and 18 recitation periods. Invertebrate work only should be attempted. The amoeba, paramecium, bell-animaleule, hydra, clam, earth-worm, crawfish and grasshopper should be studied. The addition of the starfish and sponge is desirable.

A year's work should include further study of insects, with their transformations, and a brief course in vertebrate dissection, using the fish, frog and pigeon as the main subjects. Several field excursions should be made, and the number of laboratory periods may be reduced to 45, equivalent time being given to other phases of the work.

There should be at least one compound microscope for every four students. Other apparatus may be very simple. It

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is not necessary to purchase marine material, as every locality furnishes animals enough for a good course.

#### ACCREDITED SCHOOLS.

Any high school or academy whose course of instruction carries the branches requisite for admission to one or more of the courses of the University may make application to be placed on its accredited list of preparatory schools. The application will show the courses of study, the number of recitations per week in each subject, the length of recitation period, the number of weeks of school in the year, the laboratory equipment, number of volumes in the library, etc. The application should also show the number of teachers engaged in high school work, their collegiate training and professional experience. Blank forms of application will be furnished by the Registrar of the University. On the basis of these returns a representative of the University will visit and examine the school. If the Faculty approve, after considering the report of the representative, the school will be duly recognized as one of the accredited schools of the University and the fact will be published in the annual catalogue. The graduates of the school will thenceforth be admitted on the certificate of the principal to any collegiate course for which they have been fitted.

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#### UNIVERSITY ENTRANCE REQUIREMENTS PROPOSED FOR 1903.

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##### TO THE COLLEGE OF LETTERS AND SCIENCES.

##### SUBJECTS 24 POINTS.

A.—Required 18 points.	Points.
Algebra, (through Quadratics) . . . . .	3
English, . . . . .	4
Geometry, Plane and Solid, . . . . .	3
History, . . . . .	2

	Points.
Language, other than English, (Latin, 4 at least) . . . . .	6
<b>B.—Optional 6 points.</b>	
English, . . . . .	2
French, . . . . .	2 or 4
German, . . . . .	2 or 4
Greek, . . . . .	2 or 4
History, . . . . .	2 or 4
Latin, . . . . .	2 or 4
Biological Science, (Botany, Zoology) . . .	2
Physical Science, (Chem. or Physics) . . .	2
Trigonometry, Plane . . . . .	1
Astronomy 1	
Civics, 1	
Geology 1	
Phys. Geog. 1	
Physiology and Hyg. 1	
Polit. Economy I	
	Not more than 2 points accepted.

**TO THE SCHOOL OF ENGINEERING AND COLLEGE  
OF AGRICULTURE.**

**SUBJECTS 24 POINTS.**

	Points.
<b>A.—Required 12 points,</b>	
Algebra, through Quadratics, . . . . .	3
English, . . . . .	4
Geometry, Plane and Solid, . . . . .	3
Physical Science, (Chem. or Physics) . . .	2
<b>B.—Optional 12 points.</b>	
English . . . . .	2
History, . . . . .	2 or 4 or 6
French, . . . . .	4 or 6
German, . . . . .	4 or 6
Greek, . . . . .	4 or 6
Latin, . . . . .	4 or 6
Manual Training, . . . . .	2
Mechanical Drawing, . . . . .	1

	Points.
Biological Science, (Botany, Zoology) . . . . .	2
Physical Science, (Chemistry or Physics) . . . . .	2
Trigonometry, Plane, . . . . .	1
Astronomy, 1	}
Civics, 1	}
Geology, 1	}
Phys. Geog. 1	}
Physiology and Hyg. 1	}
Political Economy 1	}

Not more than 2 points accepted.

## CREDITS.

1.—A "point" is given for five recitations per week of not less than 40 minutes each during one semester of not less than 18 weeks, adequate time being given for the preparation of the lesson.

2.—No credit will be given for less than one point.

3.—In Science work partly done in laboratories, two periods of laboratory work are equivalent to one period of recitation with the preparation therefor.

4.—The total credit for history is six points, two in required European History, and four in optional French, German and English History.

5.—The maximum credit in German or French for entrance to either College is six points.

6.—A student who presents less than the required number of points may be conditionally admitted by the Committee on Courses, provided that the deficiency does not exceed four points and that the conditions be removed within the year.





